

REMARKS

Reconsideration of this application, based on this amendment and these following remarks, is respectfully requested.

Claims 1, 3 through 11, 13 through 21, 23 through 28, 30 through 34, 38, 40 through 42, 44, and 45 remain in this case. Claims 1, 3 through 8, 11, 13 through 18, 21, 23 through 26, 28, 30 through 34, 38, 40 through 42, 44, and 45 are amended. Claims 2, 12, 22, 29, 35 through 37, 39, and 43 are canceled.

Claims 29 through 45, as renumbered after the Preliminary Amendment, were objected to because of errors in their dependency resulting from that renumbering. To the extent that these claims remain in this case, each has been amended to properly depend on claims remaining in this application. Applicants submit that the basis for the objection to these claims is overcome by this amendment.

Claims 6, 16, 26, and 33 were objected to as depending on a rejected claim, but were otherwise indicated as directed to allowable subject matter.¹ Each of these claims is amended to be placed into independent form, incorporating the elements of the original claims upon which they respectively depended. These claims are also amended for clarity. No new matter is presented by this amendment to claims 6, 16, 26, and 33, and as such Applicants submit that these claims are now in condition for allowance.

Claims 1, 2, 11, and 12 were rejected under §102(e) as anticipated by the Williams reference². Claims 3 and 13 were rejected under §103 as unpatentable over the Williams reference in view of Applicants' admitted prior art.³ Claims 9, 10, 19, and 20 were rejected under §103 as unpatentable over the Williams reference in view of the Kramer reference⁴, and

¹ Office Action of January 18, 2006, page 9.

² U.S. Patent Application Publication No. 2001/0042230 A1, published November 15, 2001, from an application by Williams et al. filed May 10, 2001.

³ Specification of S.N. 10/678,893, paragraph [0009].

⁴ U.S. Patent No. 6,182,239 B1, issued January 20, 2001 to Kramer.

claims 4, 5, 19, and 20 were rejected under §103 as unpatentable over the Williams reference in view of the Bruce et al. reference⁵.

Claim 1 is amended to overcome the rejection and for clarity. Claim 1 is amended to now recite that the indicator has a value indicative of the reliability of the first block, and that the encoding steps use a first error detection algorithm responsive to that indicator meeting a criterion, and use a second error detection algorithm responsive to that indicator not meeting the criterion. In addition, the second error detection algorithm is recited as having a higher error detection capability than the first error detection algorithm. Support for this amendment to claim 1 is clearly present in the specification⁶, and as such no new matter is presented by this amendment to claim 1.

Claim 2 is canceled as a result of the amendment to claim 1. Claims 3 through 5, 7, and 8 are amended for consistency with the amendment to claim 1. Claim 11 is amended to now depend on amended claim 1, and for consistency with amended claim 1; its dependent claim 12 is canceled, and its dependent claims 13 through 15, 17, and 18 are amended for consistency with the amendment to claims 1 and 11.

Applicants respectfully submit that amended claim 1 and its dependent claims are novel and patentably distinct over the Williams reference, the other applied references, and the other prior art of record in this case.

Regarding the Williams reference, Applicants submit that this reference lacks teachings regarding a second error detection algorithm, according to which the data is encoded responsive to the indicator not meeting a criterion, where the indicator has a value indicative of the reliability of the first block to which data is to be written. As stated in the Office Action,⁷ the Examiner asserted that the Williams reference teaches the encoding of data to be written to a first block, according to ECC coding, in response to the state of an indicator of whether to include

⁵ U.S. Patent No. 5,956,743, issued September 21, 1999 to Bruce et al.

⁶ Specification, *supra*, at page 14, line 25 through page 15, line 18; page 16, line 16 through page 18, line 9; page 18, line 25 through page 21, line 8. *See also* specification, *supra*, page 7, line 22 through page 8, line 10.

⁷ Office Action, *supra*, pages 3 and 4.

ECC calculating or to disable such ECC coding. Relative to claim 2, the Examiner asserts that the disabling of ECC coding altogether corresponds to the second encoding algorithm as claimed.

Applicants first respectfully submit that the indicator asserted by the Examiner has no relationship to the reliability of the memory block to which data is to be written. Indeed, the "indicator" of the Williams reference has no relationship whatsoever to the status of that block, but instead is merely an indicator of the block being used for testing the ECC functionality of the memory system.⁸ Accordingly, the Williams reference fails to disclose the obtaining of an indicator having a value indicative of the reliability of the first block, as required by amended claim 1.

Secondly, Applicants submit that the disabling of ECC coding does not constitute a second error detection algorithm (or even a first error detection algorithm). Rather, the disabling of error correction coding results in no error correction encoding whatsoever. The Williams reference therefore fails to disclose encoding data using a first or a second error correction algorithm, much less where the second error detection algorithm has a higher error detection capability than the first error detection algorithm, as now required by amended claim 1. And because the Williams reference fails to disclose a second error detection algorithm, the Williams reference necessarily fails to disclose the encoding of data according to the first error detection algorithm responsive to the indicator meeting a criterion, and the encoding of data according to the second error detection algorithm responsive to the indicator not meeting the criterion, as required by amended claim 1.

For these reasons, Applicants submit that amended claim 1 and its dependent claims are all novel over the Williams reference.

Applicants further respectfully submit that amended claim 1 and its dependent claims are also patentably distinct over the Williams reference in view of the other prior art of record in this

⁸ Williams, *supra*, paragraph [0041].

case, because the combined teachings of the references fall short of the requirements of amended claim 1.

While the admitted prior art states that 1-bit and 2-bit ECC algorithms are known, that admitted prior art in no way includes prior knowledge of selecting which of these algorithms are to be used to encode data written to a block of memory based on whether an indicator value indicative of block reliability meets or does not meet a criterion. The Kramer and Bruce et al. references also lack teachings in this regard, nor were these references asserted as providing such teachings.

Applicants further respectfully submit that there is no suggestion from the prior art to modify these teachings in such a manner as to reach amended claim 1. As described in the specification,⁹ the inventive method of claim 1 provides the important advantage of optimizing the error detection and correction coding based on the reliability of the memory block being written. For example, if the block has been subjected to relatively few erase cycles, a less robust error correction coding may be applied to save memory space; on the other hand, if the block is relatively worn because of a larger number of erase cycles, more robust error correction coding can be used to improve the accuracy of the data stored in that block. Nowhere do any of the applied references suggest the dynamic selection of error detection algorithms, much less in response to a reliability indicator value, as required by amended claim 1. And as such, the prior art nowhere suggests modifying the teachings of the Williams and other references in such a manner as to reach Applicants' invention of amended claim 1.

For these reasons, Applicants submit that amended claim 1 and its dependent claims are not only novel, but are patentably distinct over the prior art of record in this case.

Claims 21, 22, 28, and 29 were rejected under §102(e) as anticipated by the Williams reference. Claims 23 and 30 were rejected under §103 as unpatentable over the Williams reference in view of Applicants' admitted prior art. Claims 27 and 34 were rejected under §103 as unpatentable over the Williams reference in view of the Kramer reference.

⁹ Specification, *supra*, page 8, lines 12 through 29.

Claim 21 is amended, similarly as claim 1 discussed above, to overcome the rejection and for clarity. Amended claim 21 now requires code devices for obtaining an indicator having a value indicative of reliability of the first block of the non-volatile memory. The claimed system also now requires code devices for encoding the data using a first error detection algorithm responsive to the indicator meeting a criterion, and for encoding the data using a second error detection algorithm responsive to the indicator not meeting the criterion, the second error detection algorithm having a higher error detection capability than the first error detection algorithm. The specification of this application clearly supports this amendment to claim 21,¹⁰ and as such no new matter is presented.

Because of this amendment to claim 21, claim 22 is canceled as superfluous, and claims 23 through 25 are amended for consistency with amended claim 21. Claim 28 is amended to now depend on amended claim 21 in a manner consistent with that claim, claim 29 is canceled, and claims 30 through 32 and 34 are amended for consistency with the amendment to claim 21.

Applicants respectfully submit that amended claim 21 and its dependent claims are novel and patentably distinct over the Williams reference and the other prior art of record in this case.

As discussed above relative to claim 1, Applicants submit that the Williams reference fails to disclose an indicator having a value indicative of reliability of a first block, much less code devices for obtaining such an indicator as required by amended claim 21. To the extent that the Williams reference teaches an indicator, its "indicator" merely identifies the block being used for testing ECC functionality,¹¹ and has no relationship to the reliability of the block. The claim requirement of code devices for obtaining an indicator associated with the first block and having a value indicative of the reliability of that block, is therefore not taught by the Williams reference.

Applicants also submit that Williams reference nowhere teaches both first and second error detection algorithms, where the second error detection algorithm has a higher error

¹⁰ Specification, *supra*, at page 14, line 25 through page 15, line 18; page 16, line 16 through page 18, line 9; page 18, line 25 through page 21, line 8. *See also* specification, *supra*, page 7, line 22 through page 8, line 10.

detection capability than the first, as claimed. Rather, the Williams reference discloses only selectively performing or disabling ECC coding. But disabling ECC coding does not constitute encoding data using a second error detection algorithm; instead, it involves no encoding at all. For these reasons, Applicants submit that the Williams reference fails to disclose code devices for encoding data using a first or a second error correction algorithm, where the second error detection algorithm has a higher error detection capability than the first error detection algorithm, as claimed, much less responsive to an indicator meeting or not meeting a criterion, respectively.

For these reasons, Applicants submit that amended claim 21 and its dependent claims are all novel over the Williams reference.

Applicants further respectfully submit that amended claim 21 and its dependent claims are also patentably distinct over the Williams reference in view of the other prior art of record in this case, because the combined teachings of the references fall short of the requirements of amended claim 21.

As discussed above relative to claim 1, there is no disclosure or suggestion anywhere in the admitted prior art, nor in the Kramer and Bruce et al. references, of those limitations of amended claim 21 that are missing from the Williams reference. Specifically, none of the references teach or suggest selecting one of a first and second error detection algorithm for the encoding of data to be written to a block of memory, with the selection made in response to an indicator value indicative of block reliability meeting or not meeting a criterion. The combined teachings of the references therefore fall short of the requirements of amended claim 21.

And especially considering the important advantages provided by the invention of amended claim 21 and its dependent claims, suggestion is wholly lacking in the prior art to modify these teachings in such a manner as to reach the claims. Nowhere in the prior art is there any hint of the desirability of optimizing the error detection and correction coding based on the reliability of the memory block being written, much less suggestion of the combination of code devices in the system of amended claim 21 that accomplish this beneficial result. Accordingly,

¹¹ Williams, *supra*, paragraph [0041].

Applicants respectfully submit that the prior art nowhere suggests modifying the teachings of the Williams and other references in such a manner as to reach Applicants' invention of amended claim 21.

For these reasons, Applicants submit that amended claim 21 and its dependent claims are novel and patentably distinct over the prior art of record in this case.

To advance the prosecution of this case, claims 35 through 37 are canceled, obviating the rejection of those claims.

Claims 38, 39, 42, and 43 were rejected under §102(e) as anticipated by the Williams reference. Claims 40 and 44 were rejected under §103 as unpatentable over the Williams reference in view of Applicants' admitted prior art. Claims 41 and 45 were rejected under §103 as unpatentable over the Williams reference in view of the Kramer reference.

Claim 38 is now amended in similar fashion as claims 1 and 21, discussed above, to overcome the rejection and for clarity. Amended claim 38 now requires means that obtain an indicator having a value indicative of reliability of the first block of the non-volatile memory, and means that encode data to be stored in this first block using a first error detection algorithm responsive to the indicator meeting a criterion, and using a second error detection algorithm responsive to the indicator not meeting the criterion, where the second error detection algorithm having a higher error detection capability than the first error detection algorithm. The specification of this application clearly supports this amendment to claim 38,¹² and as such no new matter is presented.

Claim 39 is canceled, and claims as superfluous, and claims 40 and 41 are amended, for consistency with amended claim 38. Claim 42 is amended to now depend on amended claim 38, claim 43 is canceled, and claims 44 and 45 are amended, for consistency with the amendment to claim 38.

¹² Specification, *supra*, at page 14, line 25 through page 15, line 18; page 16, line 16 through page 18, line 9; page 18, line 25 through page 21, line 8. See also specification, *supra*, page 7, line 22 through page 8, line 10.

Applicants respectfully submit that amended claim 38 and its dependent claims are novel over the Williams reference, and patentably distinct over it and the other prior art of record in this case.

As discussed above relative to claims 1 and 21, Applicants submit that the Williams reference fails to disclose an indicator having a value indicative of reliability of a first block, and therefore fails to disclose means that obtain such an indicator for a first block, as claimed. The indicator of the Williams reference instead merely identifies a block as being used for testing ECC functionality.¹³ That indicator has nothing to do with the reliability of that block, or any block. Accordingly, the Williams reference fails to disclose means that obtain an indicator associated with the first block and having a value indicative of the reliability of that block, as required by amended claim 38.

The Williams reference also fails to disclose the selective use of any first and second error detection algorithms, much less where the second error detection algorithm has a higher error detection capability than the first, as required by claim 38. The Williams reference instead only discloses selectively applying or disabling ECC coding. The disabling of ECC coding as taught by Williams is not and cannot correspond to encoding data using a second error detection algorithm. By not doing ECC coding at all, no error detection algorithm is applied whatsoever. The Williams reference therefore necessarily fails to disclose means that encode data using a first or a second error correction algorithm, where the second error detection algorithm has a higher error detection capability than the first error detection algorithm, as claimed, and necessarily fails to disclose the selecting of the error correction algorithm in response to an indicator meeting or not meeting a criterion, respectively.

For these reasons, Applicants submit that amended claim 38 and its dependent claims are all novel over the Williams reference.

Applicants further respectfully submit that amended claim 38 and its dependent claims are patentably distinct over the Williams reference in view of the other prior art of record in this

¹³ Williams, *supra*, paragraph [0041].

case, because the combined teachings of the references fall short of the requirements of the amended independent claim.

As discussed above, neither the admitted prior art, nor the Kramer and Bruce et al. references, anywhere disclose the requirements of amended claim 38 that were also not found in the Williams reference. None of those items of prior art teaches or suggests any means for encoding data according to a first or a second error detection algorithm, with the selection of the algorithm responsive to whether an indicator value indicative of block reliability meets a criterion or not. Even if suggestion is present to combine these references, their combined teachings of the references would fall short of the requirements of amended claim 38.

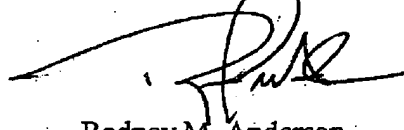
The important advantages provided by the invention of amended claim 38 and its dependent claims support the conclusion that there is no suggestion in the prior art to modify these teachings in such a manner as to reach the claims. The prior art nowhere mentions or suggests that it would be desirable to optimize the error detection and correction coding based on the reliability of the memory block being written. Accordingly, there can be no suggestion in the art of the system of amended claim 38 that provides this function. Applicants therefore respectfully submit that the prior art nowhere suggests modifying the teachings of the Williams and other references in such a manner as to reach Applicants' invention of amended claim 38.

For these reasons, Applicants submit that amended claim 38 and its dependent claims are novel and patentably distinct over the prior art of record in this case.

The prior art cited as pertinent has been considered, but is not felt to come within the scope of the claims in this case.

For the above reasons, Applicants respectfully submit that all claims now in this case are in condition for allowance. Reconsideration of this application is therefore respectfully requested.

Respectfully submitted,



Rodney M. Anderson

Registry No. 31,939

Attorney for Applicants

Anderson, Levine & Lintel, L.L.P.

14785 Preston Road, Suite 650

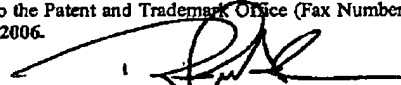
Dallas, Texas 75254

(972) 664-9554

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Rodney M. Anderson
Registry No. 31,939